WHAT IS CLAIMED IS:

1. A semiconductor device having a lateral high-breakdown-voltage transistor comprising:

a first-conductivity-type semiconductor layer;

a second-conductivity-type source region formed in the semiconductor layer;

a second-conductivity-type drain region formed in or outside the semiconductor layer, separated from the source region;

a gate electrode formed above the semiconductor layer between the drain region and the source region, insulated from the semiconductor layer;

a second-conductivity-type drain contact region formed in the drain region and having a higher impurity concentration than the drain region;

a drain wiring electrically connected to the drain region via the drain contact region;

a first-conductivity-type substrate contact region formed adjacent to the source region; and

a source wiring electrically connected to the source region, and also connected to the semiconductor layer via the substrate contact region, the source wiring touching a portion of the source region and the substrate contact region, thereby forming a contact surface therebetween, the substrate contact region laterally extending from inside the contact surface to outsid the contact surface.

2. The semiconductor device having the lateral high-breakdown-voltage transistor according to claim 1, wherein the substrate contact region laterally extends from inside the contact surface of the source wiring to a channel formed below the gate electrode.

3. The semiconductor device having the lateral high-breakdown-voltage transistor according to claim 1, wherein a pair of gate electrodes is formed laterally outside the substrate contact region, a plurality of the substrate contact regions are in existence such that the substrate contact regions alternately extend to opposite portions of channels formed below the gate electrodes.

4. The semiconductor device having the lateral high-breakdown-voltage transistor according to claim 1, wherein a pair of gate electrodes is formed laterally outside the substrate contact region such that the substrate contact region extends to opposite portions of channels formed below the gate electrodes.

5. A semiconductor device having a lateral high-breakdown-voltage transistor comprising:

a first-conductivity-type semiconductor layer;

a second-conductivity-type source region formed in the semiconductor layer;

a second-conductivity-typ drain region formed in or outside the semiconductor layer, separated from the source region;

a gate electrode formed above the semiconductor layer between the drain region and the source region, insulated from the semiconductor layer;

a second-conductivity-type drain contact region formed in the drain region and having a higher impurity concentration than the drain region;

a drain wiring electrically connected to the drain region via the drain contact region;

a first-conductivity-type substrate contact region formed adjacent to the source region;

a source wiring electrically connected to the source region, and also connected to the semiconductor layer via the substrate contact region; and

a first-conductivity-type low resistance layer formed in the semiconductor layer in contact with a bottom of the source region and having a higher impurity concentration than the semiconductor layer.

6. A semiconductor device having a lateral high-breakdown-voltage transistor comprising:

a first-conductivity-type semiconductor layer;

a second-conductivity-type source region formed in the semiconductor layer;

a second-conductivity-type drain region formed in or outside the semiconductor layer, separated from the source region;

a gate electrode formed above the semiconductor layer between the drain region and the source region,

insulated from the semiconductor layer;

a second-conductivity-type drain contact region formed in the drain region and having a higher impurity concentration than the drain region;

a drain wiring electrically connected to the drain region via the drain contact region;

a first-conductivity-type substrate contact region formed adjacent to the source region; and

a source wiring electrically connected to the source region, and also connected to the semiconductor layer via the substrate contact region,

a distance from a contact surface of the drain wiring and the drain contact region to an edge of the source region side of the drain contact region being 5 $\mu$m or more.

~~7. A semiconductor device having a lateral high-breakdown-voltage transistor comprising:~~

a first-conductivity-type semiconductor layer;

a second-conductivity-type source region formed in the semiconductor layer;

a second-conductivity-type drain region formed in or outside the semiconductor layer, separated from the source region;

a gate electrode formed above the semiconductor layer between the drain region and the source region, insulated from the semiconductor layer;

a second-conductivity-type drain contact region

formed in the drain region and having a higher impurity concentration than the drain region;

a drain wiring electrically connected to the drain region via the drain contact region;

a first-conductivity-type substrate contact region formed adjacent to the source region; and

a source wiring electrically connected to the source region, and also connected to the semiconductor layer via the substrate contact region,

the drain contact region having a bottom at a level lower than a bottom of the drain region.

8. The semiconductor device having the lateral high-breakdown-voltage transistor according to claim 7, wherein a total amount of a second-conductivity-type impurity contained in the drain contact region is $3.0 \times 10^{12}$ $cm^{-2}$ or more.

9. The semiconductor device having the lateral high-breakdown-voltage transistor according to claim 7, further comprising a second-conductivity-type semiconductor layer formed in below region of the first-conductivity-type semiconductor layer, the drain contact region is formed in contact with the second-conductivity-type semiconductor layer.

10. A semiconductor device having a lateral high-breakdown-voltage transistor comprising:

a first-conductivity-type semiconductor substrate;

a second-conductivity-type buried layer formed in

the semiconductor substrate;

a second-conductivity-type epitaxial layer formed on the buried layer;

a first-conductivity-type well layer formed in a surface portion of the epitaxial layer;

a second-conductivity-type source region formed in a surface portion of the well layer;

a second-conductivity-type drain region formed in a surface portion of the epitaxial layer or the well layer, separated from the source region;

a second-conductivity-type deep diffusion layer formed in the drain region but extending to a level lower than a bottom of the drain region in contact with the buried layer, and having a higher impurity concentration than the drain region;

a gate electrode formed above the well layer between the drain region and the source region, insulated from the well layer;

a first drain electrode formed on the deep diffusion layer and electrically connected to the drain region via the deep diffusion layer;

a source electrode formed on and electrically connected to the source region;

a second-conductivity-type isolating diffusion layer surrounding the drain region and the source region, separated from the well layer, and extending to the buried layer; and

a second drain electrode formed on the isolating diffusion layer and electrically connected to the first drain electrode,

a distance between the deep diffusion layer and the source region being greater than a thickness of th epitaxial layer on the buried layer.

11. The semiconductor device having the lateral high-breakdown-voltage transistor according to claim 10, wherein the drain region is formed in the well layer.

12. The semiconductor device having the lateral high-breakdown-voltage transistor according to claim 10, wherein the distance is 10% - 50% greater than the thickness.

13. The semiconductor device having the lateral high-breakdown-voltage transistor according to claim 10, wherein the deep diffusion layer has an impurity concentration ranging from $3.0 \times 10^{12}$ $cm^{-3}$ to $5.0 \times 10^{15}$ $cm^{-3}$.

14. The semiconductor device having the lateral high-breakdown-voltage transistor according to claim 10, further comprising a second-conductivity-type drain contact region formed in a surface portion of the deep diffusion layer and having a higher impurity concentration than the deep diffusion layer.

15. A semiconductor device having a lateral high-breakdown-voltage transistor comprising:

a first-conductivity-type semiconductor substrate;

a second-conductivity-type buried layer formed in the semiconductor substrate;

a second-conductivity-type epitaxial layer formed on the buried layer;

a first-conductivity-type well layer formed in a surface portion of the epitaxial layer;

a second-conductivity-type source region formed in a surface portion of the well layer;

a second-conductivity-type drain region formed in a surface portion of the well layer, separated from the source region;

a second-conductivity-type drain contact region formed in a surface portion of the drain region and having a higher impurity concentration than the drain region;

a gate electrode formed above the well layer between the drain region and the source region, insulated from the well layer;

a first drain electrode formed on the drain contact region and electrically connected to the drain region via the drain contact region;

a source electrode formed on and electrically connected to the source region;

a second-conductivity-type isolating diffusion layer surrounding the well layer, separated from the well layer, and extending to the buried layer; and

a second drain electrode formed on the isolating

diffusion layer and el ctrically connected to the first drain electrode,

a distance between the drain contact region and the source region being greater than a thickness of the epitaxial layer on the buried layer.

16. The semiconductor device having the lateral high-breakdown-voltage transistor according to claim 15, wherein the distance is 10% - 50% greater than the thickness.

17. The semiconductor device having the lateral high-breakdown-voltage transistor according to claim 1, further comprising a diode formed by short-circuiting the source wiring and the gate electrode.

18. The semiconductor device having the lateral high-breakdown-voltage transistor according to claim 5, further comprising a diode formed by short-circuiting the source wiring and the gate electrode.

19. The semiconductor device having the lateral high-breakdown-voltage transistor according to claim 6, further comprising a diode formed by short-circuiting the source wiring and the gate electrode.

20. The semiconductor device having the lateral high-breakdown-voltage transistor according to claim 7, further comprising a diode formed by short-circuiting the source wiring and the gate electrode.